Claims

1. An adenovirus type 35 vector, which is derived from the adenovirus type 35 genome at least by partial or total deletion of the E1 region therefrom.

2. The adenovirus type 35 vector according to claim 1, wherein the E1 protein encoded by the aforementioned E1 region is rendered incapable of being expressed or is functionally defective.

3. The adenovirus type 35 vector according to claim 1 or 2, wherein part of the E1 region is equivalent to the region between nucleotides 367 and 2,917 of the adenovirus type 35 genome.

4. The adenovirus type 35 vector according to claim 1 or 2, wherein part of the E1 region is equivalent to the region between nucleotides 367 and 3,375 of the adenovirus type 35 genome.

5. The adenovirus type 35 vector according to claim 1, wherein the E3 region is further partially or totally deleted from the adenovirus type 35 genome.

6. The adenovirus type 35 vector according to claim 5, wherein part of the E3 region is equivalent to the region between nucleotides 2,776 and 29,732 of the adenovirus type 35 genome.

7. The adenovirus type 35 vector according to any one of claims 1 to 6, wherein a foreign gene is inserted into a site that lacks part or all of the E1 and/or E3 regions.

8. A method for producing an adenovirus type 35 vector comprising the following steps of:

(1) preparing an adenovirus type 35 vector derived from the adenovirus type 35 genome by partially or totally deleting the E1 region therefrom;

(2) allowing the prepared vector to infect and proliferate in adenovirus E1 protein- and E4 protein-expressing cells; and

(3) recovering the proliferated vectors.

9. The method for producing an adenovirus type 35 vector according to claim 8, wherein step (1) further comprises a step of partially or totally deleting the E 3 region.

10. The method for producing an adenovirus type 35 vector according to claim 8, which further comprises a step of inserting a foreign gene into a deleted site between step (1) and step (2).

11. The method for producing an adenovirus type 35 vector according to claim 8, wherein the cell employed in step (2) is of the 293-cell.

12. An adenovirus type 35 vector, which is obtained by the method for producing an adenovirus type 35 vector according to any one of claims 8 to 11.

13. A method for producing an adenovirus type 35 vector comprising the following steps of:

(1) preparing part of the adenovirus type 35 genome that lacks part or all of the E1 region;

(2) ligating the part of the adenovirus type 35 genome to the remaining portion of the adenovirus type 35 genome and thereby preparing an adenovirus type 35 vector derived from the adenovirus type 35 genome by partial or total deletion of the E1 region therefrom;

(3) allowing the prepared vector to infect and proliferate in adenovirus E1 protein- and E4 protein-expressing cells; and

(4) recovering the proliferated vectors.

14. The method for producing an adenovirus type 35 vector according to claim 13, wherein step (1) or (2) further comprises a step of partially or totally deleting the E 3 region.

15. The method for producing an adenovirus type 35 vector according to claim 13, wherein step (1) further comprises a step of inserting a foreign gene into a deleted site.

16. The method for producing an adenovirus type 35 vector according to claim 13, wherein the cell employed in step (3) is of the 293-cell line.

17. The method for producing an adenovirus type 35 vector according to claim 13, wherein the part of the adenovirus type 35 genome mentioned in (1) is equivalent to a region lacking the region between nucleotides 367 to 2,917 or that between nucleotides

367 to 3,375 of the region between nucleotides 1 to 7,932.

18. An adenovirus type 35 vector, which is obtained by the method for producing an adenovirus type 35 vector according to any one of claims 13 to 17.

19. A method for gene transfection, wherein the adenovirus type 35 vector according to any one of claims 1 to 7, 12, and 18 is allowed to infect a target cell.

20. The method for gene transfection according to claim 19, wherein the target cell is selected from the group consisting of hematopoietic cells, blood stem cells, ES cells, pluripotent stem cells, and tissue stem cells.

21. The method for gene transfection according to claim 19, wherein the target cell is a $CD34^+$ cell.